ABSTRACT

A family of slurries useful in modifying exposed surfaces of wafers for semiconductor fabrication are provided along with methods of modifying exposed surfaces of wafers for semiconductor fabrication utilizing such a family of working slurries, and semiconductor wafers. The slurries of the invention are a solution of initial components, the components comprising: a sulfonated zwitterion selected from 2-(N-Morpholino)ethanesulfonic acid, (3-[N-Morpholino])propanesulfonic acid, 2-[(2-Amino-2-oxoethyl)amino]ethanesulfonic acid, Piperazine-N, N'-bis(2-ethanesulfonic acid), 3-(N-Morpholino)-2-hydroxypropanesulfonic acid, *N* ,N-Bis(2-hydroxyethyl)-2-aminoethanesulfonic acid, 3-(N-Morpholino)propanesulfonic acid, N-(2-Hydroxyethyl)piperazine-N'-(2-ethanesulfonic acid), N-Tris(hydroxymethyl)methyl-2 aminoethanesulfonic acid, 3-[*N* ,N-Bis(2-hydroxyethyl)amino]-2-hydroxypropanesulfonic acid, 3-[N -Tris(hydroxymethy l)methylamino)- 2-hydroxypropanesulfonic acid, N-(2-hydroxyethyl)piperazine-N'-(2-hydroxypropanesulfonic acid), Piperazine-N ,N'-bis(2-hydroxypropanesulfonic acid), N-(2-Hydroxyethyl)piperazine-N'-(3-propanesulfonic acid), N-Tris(hydroxymethyl)methyl-3-aminopropanesulfonic acid, 3-[(1,1-Dimethy 1- 2-hydroxyethyl)amino]-2-hydroxypropanesulfonic, acid, 2-(N-Cyclohexylamino)ethanesulfonic acid, 3-(Cyclohexylamino)-2-hydroxy-l-propanesulfonic acid, 2-Amino-2-methyl-l-propanol, 3-(Cyclohexylamino)-1-propanesulfonic acid, an oxidizing agent; optionally, a passivating agent; optionally a chelating agent,, optionally abrasive particles, optionally a surfactant, optionally a secondary buffering agent and water. The method of the invention comprises the steps of: a) providing a wafer comprising a first material having a surface etched to form a pattern and a second material deposited over the surface of the first material; b) contacting the second material of the wafer with abrasive in the presence of the working slurry; and c) relatively moving the wafer or polishing pad or both while the second material is in contact with the slurry and abrasive particles until an exposed surface of the wafer is planar and comprises at least one area of exposed first material and one area of exposed second material.